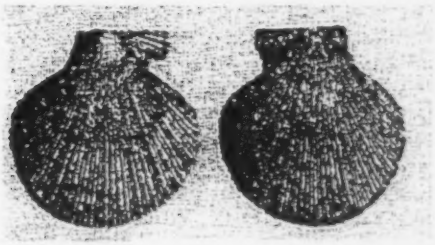

Iceland Scallop (*Chlamys islandica*) Resource from Newfoundland – An Interim (1999) Review

Background

Three scallop management areas are generally recognized in the Newfoundland Region: NAFO Div. 4R (Strait of Belle Isle), NAFO Div. 3LNO (Grand Bank), and NAFO Subdiv. 3Ps (St. Pierre Bank). Formal assessments were not undertaken in 1999 because the fishery is in the second of a 3-year management plan. Instead, summaries of updated information from the fishery were examined. In addition, issues raised by 4R stakeholders in 1998 pertaining to (a) recruitment, (b) effort distribution, (c) catch rates, and (d) conversion factors to estimate whole round weights from meats were reviewed.

Overall landings in Newfoundland in 1998 declined 45% from the previous year (6,162 vs. 11,120 t, round). Total Allowable Catch (TAC) in 1999 for the Newfoundland Region as a whole has been reduced by 20% (14,700 t vs. 11,700 t, round).

The 1998 Fishery

NAFO Div. 3LNO (Grand Bank)

Removals in 1998 dropped by 67% (3,986 to 1,310 t, round). The number of vessels prosecuting the fishery declined by 60% (52 to 21) due to diversion of effort towards shrimp. Most (86%) of the catch came from Div. 3N where 83% of the total effort had been directed.

The nominal catch (777 t) from the aggregations around the Lilly Canyon and Carson Canyon fell short of the TAC by 14%. Also, catch rates here have declined by approximately 10% in each of the last three years. The trend towards smaller meats (i.e. high counts) continued into 1998.

Catches from 3Nf continued declining from the record set in its first year (1996). Again, the nominal catch fell short of the 1998 catch limit set for the area (164 t out of 400 t). Here, too, there is a dominance of small meats.

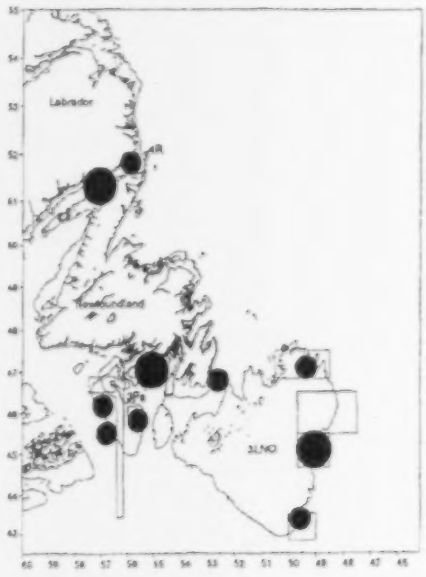

Fig. 1. Iceland scallop aggregations fished in Newfoundland, 1998.

NAFO Subdiv. 3Ps (St. Pierre Bank)

Catches dropped by nearly 50% from 1997 (2,763 t vs. 5,245 t, round). A record decline (1,321 to 13 t or -99%) was evident in the eastern aggregation first fished in 1997. The decline was not as severe (1,497 to 508 t or -66%) to the west but catch rates were halved. Near-shore aggregations off Perch Rocks/Cape St. Mary's also recorded a decline (1,197 to 842 t or -30%), but catch rates have remained the same (~52 kg/tow), suggesting that vessels had moved around to fish newly-discovered aggregations.

Canada/France Transboundary Area

Scallop aggregations within the transboundary area continue to be plagued by starfish. The most recent (1998) survey points to a biomass that is only 10% of that estimated in 1992. There was no directed fishing effort in this area. The prognosis continues to be poor.

NAFO Div. 4R (Strait of Belle Isle)

Although a 1998 catch limit of 930 t round had been adopted for this fishery, a mid-season adjustment permitted additional removals estimated at 380 t bringing the total to 1,310 t. Catch rates remained unchanged from 1997. However, the majority of the catch (94%) came from a limited southern portion of the fishing area.

The need to revisit the science within the plan became necessary because of the divergent views between stakeholders and Science. Among the issues raised by fishers, two required immediate attention: (a) recruitment and (b) the conversion factor used to estimate round (whole) weights from meat weights. Other concerns included reports of record catch rates in 1998 and perceptions that the fishing effort was widely distributed and indicative of resource availability.

Recruitment

Scallops here consist primarily of old animals with a modal size of 90 mm. As elsewhere, a few, sometimes well-separated, age cohorts drive this fishery. In 1998, based on results from two research vessel surveys, one each in 1995 and 1997, Science raised concerns about the recent lack of significant recruitment in this area.

In 1998, fishers indicated that small scallops were in fact abundant and that poor prices discouraged their harvesting and landing. In order to support their perspective, fisher representatives invited Science to participate in fishing missions onboard two commercial vessels. However, detailed sampling of the catches at sea did not indicate the presence of small scallops. Only eight scallops (out of 855 sampled) measured less than 60 mm and contributed to less than 0.5% of the total round weight sampled. Whereas these observations were spatially restricted and limited in scope, the research vessel data in 1995 and 1997 had been assembled from a much larger area (~611 sq. mi.). At present, there is no evidence in support of good recruitment in 4R.

While shucking of scallops at sea is now the norm in this fishery, shellstocking (landing round scallops in the shell) was the common practice in earlier years. The removal of large quantities of shells, which constitute a preferred settlement substrate for scallop larvae, may have played a role in poor settlement over a number of years. This in turn may have contributed to several consecutive years of poor recruitment. Also, it has been hypothesized that fishing activity itself may inflict collateral damage to young, *recently settled scallops.*

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Shucking scallops at sea and redistributing shells over scallop beds is widely thought to confer ecological benefits to the resource. Consequently, it is recommended that shellstocking be prohibited in this fishery in order to assist in resource rehabilitation.

Conversion Factors

The conversion factor of 9.2 currently used throughout the Newfoundland Region was derived in the early 1990's using data from fresh-caught scallops, mostly from St. Pierre Bank and to a lesser extent from the Strait of Belle Isle.

A number of items must be considered when estimating round weight from meat weight. A myriad of factors, including reproductive state, handling methods (including the duration scallops are held out of water) and shucking efficiency affect overall yield. On average, approximately 20% of the "meat" from Iceland scallop is lost during rapid manual shucking at sea. Since TAC's are based on biological yield (what is available) rather than commercial yield (what is recovered), Science had factored these considerations in deriving conversion factors.

Commercial yield from scallops long held out of water is approximately 20% higher than that estimated using fresh scallops.

Using the conversion factor of 9.2, it was determined that the 1998 catch limit of 930 t had been reached at the end of August 1998. It was at this point that fishers argued that the conversion factor employed to convert meat weights to round was flawed and requested that it be revisited. In response, Fishery Officers conducted a study that resulted in an estimated factor of 7.6. Application of this revised estimate allowed fishers to harvest an additional 380 t.

Further examination of the protocols applied in the 1998 study by the Fishery Officers indicated that the scallops had been held out of water for approximately 12 hours prior to shucking and weight determination. Application of the 20% weight loss due to fluid drainage in order to adjust for the lag in analysis time resulted in a revised conversion factor not significantly different from the original 9.2 value based on fresh round weights.

Since biomass estimates and TAC's are based on fresh round weights, it is recommended that the original conversion factor of 9.2, used for all scallop management areas in the region, be re-instated in 4R to convert meat weight to round weight.

Catch Rates and Distribution of Fishing Effort in 1998

Fishers argued that catch rates in 1998 were among the highest in some twenty years and that fishing was distributed over a much larger area than previous years. Information extracted from the 1998 logbooks, however, does not support these claims. In fact, estimated mean catch rate in 1998 remained unchanged from 1997 (74 vs. 75 lb/tow) and the 1998 fishery took place in a relatively small area compared to previous years.

Management Considerations

Because of the existance of numerous well-separated aggregations, the Strait of Belle Isle is particularly amenable to an experimental strategy to investigate scallop recruitment dynamics. Establishing refugia here may assist in the rebuilding of the stock. While fishers supported this idea in 1998, they failed to carry out agreed-to initiatives in setting out spat collectors (to estimate reproductive success).

Labrador

Inshore aggregations along the Labrador coast attracted increased attention over the last couple of years. The nominal catch has increased from 653 t to 1,190 t round.

There is no scientific information on the scallop resources in the Labrador area.

Some shucking of scallops takes place on shore and, as in 4R, may have a detrimental effect on recruitment success in the area.

Overall Management Perspectives

Fishing effort has been disproportionately high relative to the known resource base.

Strong recruitment in Iceland scallop populations tends to occur sporadically between which it is generally low or negligible. Combined with very slow growth, this means that annual exploitation rate within an aggregation has to be low to be sustainable over the long term.

The general management objective has been to achieve sustainability through a strategy of 10% exploitation of the mean research vessel biomass estimates. However, because of the interaction of the fishing gear used with the hard bottom found in Newfoundland waters, it is believed that there is considerable additional and unaccounted mortality which occurs as a result of fishing itself. Exploitation has been substantially higher than the target and has resulted in significant depletion of localized aggregations over very short time periods. When faced with depletion in one area, the fleet normally moves on to other aggregations, often newly discovered. This pattern of sequential depletion results in a form of 'pulse' fishing.

It is anticipated that newly discovered aggregations will decline as most of the suitable habitat has now been explored.

From a biological perspective, there is probably no reason why a 'pulse' fishery could not be an alternative management strategy. The key would be to maintain a balance between the number/size of commercially attractive aggregations along with a pattern of exploitation that would allow individual aggregations to be left unfished long enough to fully recover. The alternative would be periodic long-term fishery closures.

The long-term management strategy for this resource should be re-evaluated through dialogue among Science, Management and stakeholders. Stakeholders should be fully apprised of the consequences of the current management strategy for the resource.

For More Information

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References

Naidu, K.S., F. M. Cahill, and E.M. Seward. 1999. A factor to convert meat weight to round weight in the Iceland scallop, *Chlamys islandica*. CSAS Res. Doc. 99/xx. Xx p.

Mahe, J.-C., and K.S. Naidu. 1998. Update of the status of Iceland scallop resource within the transboundary area along the northern portion of St. Pierre Bank, NAFO Subdiv. 3Ps. Canada-France Scientific Working Group. 5 p.

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